1. $\dfrac{d}{dx}(c) = 0,$ *where c is a constant.*

2. $\dfrac{d}{dx}(x) = 1.$

3. $\dfrac{d}{dx}(x^n) = nx^{n-1}.$

4. $\dfrac{d}{dx}(\sqrt{x}) = \dfrac{1}{2\sqrt{x}}.$

5. $\dfrac{d}{dx}(e^x) = e^x.$

6. $\dfrac{d}{dx}(a^x) = a^x \ln a.$

7. $\dfrac{d}{dx}(\ln x) = \dfrac{1}{x}.$

8. $\dfrac{d}{dx}(\sin x) = \cos x.$

9. $\dfrac{d}{dx}(\cos x) = -\sin x.$

10. $\dfrac{d}{dx}(\tan x) = \sec^2 x.$

11. $\dfrac{d}{dx}(\sec x) = \sec x \tan x.$

12. $\dfrac{d}{dx}(\cot x) = -\cos ec^2 x.$

13. $\dfrac{d}{dx}(\cos ecx) = -\cos ecx \cot x.$

14. $\dfrac{d}{dx}(\sin^{-1} x) = \dfrac{1}{\sqrt{1-x^2}}.$

15. $\dfrac{d}{dx}(\cos^{-1} x) = \dfrac{-1}{\sqrt{1-x^2}}.$

16. $\dfrac{d}{dx}(\tan^{-1} x) = \dfrac{1}{1+x^2}.$

17. $\dfrac{d}{dx}(\cot^{-1} x) = \dfrac{-1}{1+x^2}.$

18. $\dfrac{d}{dx}(\sec^{-1} x) = \dfrac{1}{x\sqrt{x^2-1}}.$

19. $\dfrac{d}{dx}(\cos ec^{-1} x) = \dfrac{-1}{x\sqrt{x^2-1}}.$

20. $\dfrac{d}{dx}(uv) = u\dfrac{dv}{dx} + v\dfrac{du}{dx}.$

21. $\dfrac{d}{dx}(u^v) = u^v \dfrac{d}{dx}(v \ln u).$

22. $\dfrac{d}{dx}\left(\dfrac{u}{v}\right) = \dfrac{v\dfrac{du}{dx} - u\dfrac{dv}{dx}}{v^2}$

where u and v are functions of x.

DIFFERENTIATION FORMULA	INTEGRATION FORMULA	DIFFERENTIATION FORMULA	INTEGRATION FORMULA
1. $\dfrac{d}{dx}[x] = 1$	$\displaystyle\int dx = x + C$	8. $\dfrac{d}{dx}[-\csc x] = \csc x \cot x$	$\displaystyle\int \csc x \cot x\, dx = -\csc x + C$
2. $\dfrac{d}{dx}\left[\dfrac{x^{r+1}}{r+1}\right] = x^r \ (r \neq -1)$	$\displaystyle\int x^r\, dx = \dfrac{x^{r+1}}{r+1} + C \ (r \neq -1)$	9. $\dfrac{d}{dx}[e^x] = e^x$	$\displaystyle\int e^x\, dx = e^x + C$
3. $\dfrac{d}{dx}[\sin x] = \cos x$	$\displaystyle\int \cos x\, dx = \sin x + C$	10. $\dfrac{d}{dx}\left[\dfrac{b^x}{\ln b}\right] = b^x \ (0 < b, b \neq 1)$	$\displaystyle\int b^x\, dx = \dfrac{b^x}{\ln b} + C \ (0 < b, b \neq 1)$
4. $\dfrac{d}{dx}[-\cos x] = \sin x$	$\displaystyle\int \sin x\, dx = -\cos x + C$	11. $\dfrac{d}{dx}[\ln |x|] = \dfrac{1}{x}$	$\displaystyle\int \dfrac{1}{x}\, dx = \ln |x| + C$
5. $\dfrac{d}{dx}[\tan x] = \sec^2 x$	$\displaystyle\int \sec^2 x\, dx = \tan x + C$	12. $\dfrac{d}{dx}[\tan^{-1} x] = \dfrac{1}{1+x^2}$	$\displaystyle\int \dfrac{1}{1+x^2}\, dx = \tan^{-1} x + C$
6. $\dfrac{d}{dx}[-\cot x] = \csc^2 x$	$\displaystyle\int \csc^2 x\, dx = -\cot x + C$	13. $\dfrac{d}{dx}[\sin^{-1} x] = \dfrac{1}{\sqrt{1-x^2}}$	$\displaystyle\int \dfrac{1}{\sqrt{1-x^2}}\, dx = \sin^{-1} x + C$
7. $\dfrac{d}{dx}[\sec x] = \sec x \tan x$	$\displaystyle\int \sec x \tan x\, dx = \sec x + C$	14. $\dfrac{d}{dx}[\sec^{-1} |x|] = \dfrac{1}{x\sqrt{x^2-1}}$	$\displaystyle\int \dfrac{1}{x\sqrt{x^2-1}}\, dx = \sec^{-1} |x| + C$